UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,283	12/23/2003	Takeshi Asakura	3673-0163P	7867

2292 7590 12/09/2009
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
WILLIAMS, ROSS A	

ART UNIT	PAPER NUMBER
3714	

NOTIFICATION DATE	DELIVERY MODE
12/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/743,283	ASAKURA, TAKESHI	
	Examiner	Art Unit	
	ROSS A. WILLIAMS	3714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *5/26/09*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,5 and 7-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claims 1, 4 and 7 have been amended.

Claims 3 and 6 have been cancelled.

Claim 13 has been newly added.

Claims 1, 2, 4, 5, 8 – 13 are currently pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4, 5 and 7 - 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lutz (US 6,592,465) in view of Segen (US 6,072,504).

As per claim 1, Lutz discloses a method of measuring the trajectory of a golf ball that is in flight after being hit. Specifically Lutz discloses:

a first camera having an angle of view for photographing a flying ball from a back of the flying ball (Lutz disclose multiple cameras that each posses a unique and individual angle of view. Lutz discloses a first camera 114a/214a that is positioned to photograph a rear portion of the ball in flight) (Lutz 10:57 – 11:39).

a second camera having an angle of view overlapping with the angle of view of the first camera and serving to photograph the back of the flying ball later than the first camera (Lutz discloses at least one side camera 112a/212a-d that posses angles of view that are related to the first camera and photograph the back of the flying ball later than the first) (Lutz 10:57 - 11:39);

a third camera for photographing a front of the flying ball (116/216 that photographs a front portion of the ball when in flight);

a control portion for controlling photographing timings of the first, second and third cameras for obtaining a plurality of synchronized images by the first second and third cameras (Lutz discloses a trigger device that controls the timing as per when the cameras operate to take images of the ball in flight) (Lutz 5:17 – 43);

Lutz does not specifically disclose:

"a calculating portion for calculating position coordinates of the ball based on image data obtained by the first, second and third cameras ***as time series data with the flight of the golf ball by triangulation,*** *and based on the calculated .position coordinates, the ball trajectory"*

However, Segen discloses a method of tracking the trajectory and path of a ball in motion by means of cameras. Segen specifically states that frames may be sampled

and three-dimensional ball positions are determined by a digital processor which triangulates the relative positions of the tracked ball's pixel coordinates from concurrent frames from each of the cameras able to track the ball (Segen 6:16 - 45, 46 - 55).

It would be obvious to one of ordinary skill in the art to modify Lutz in view of Segen to provide a means to calculate the balls trajectory based on triangulation of the ball position coordinates in the captured frames as recorded by the cameras. By triangulating the ball positions in three dimensions an accurate representation of the balls trajectory can be obtained and be modeled.

As per claim 2, *wherein the first camera is .positioned behind a ball launch point, the second camera is positioned between the launch point and a drop point, and the third camera is positioned after the drop point* (As can be seen Lutz discloses the positioning of cameras behind the launch point, between the launch point and drop point, and after the drop point) (Lutz Fig 5 and 6).

As per claim 4, a *first camera having an angle of view for photographing a front of a flying ball* (Lutz disclose multiple cameras that each posses a unique and individual angle of view. Lutz discloses a first camera 114a/214a that is positioned to photograph a rear portion of the ball in flight) (Lutz 10:57 – 11:39)*;*

*a second camera having an angle of view overlapping with the angle of view of the first camera and serving to photograph the front of the flying ball earlier than the first camera (*Lutz discloses at least one side camera 112a/212a-d that posses angles of view that are related to the first camera and photograph the back of the flying ball later than the first) (Lutz 10:57 - 11:39);

a third camera for photographing a back of the flying ball (116/216 that photographs a front portion of the ball when in flight);

a control portion for controlling photographing timings of the first, second and third cameras for obtaining a plurality of synchronized images by the first, second and third cameras (Lutz discloses a trigger device that controls the timing as per when the cameras operate to take images of the ball in flight) (Lutz 5:17 – 43);

Lutz does not specifically disclose:

"a calculating portion for calculating position coordinates of the ball based on image data obtained by the first, second and third cameras as time series data with the flight of the golf ball by triangulation, and based on the calculated position coordinates, the ball trajectory,"

However, Segen discloses a method of tracking the trajectory and path of a ball in motion by means of cameras. Segen specifically states that frames may be sampled and three-dimensional ball positions are determined by a digital processor which triangulates the relative positions of the tracked ball's pixel coordinates from concurrent frames from each of the cameras able to track the ball (Segen 6:16 - 45, 46 - 55).

It would be obvious to one of ordinary skill in the art to modify Lutz in view of Segen to provide a means to calculate the balls trajectory based on triangulation of the ball position coordinates in the captured frames as recorded by the cameras. By triangulating the ball positions in three dimensions an accurate representation of the balls trajectory can be obtained and be modeled.

As per claim 5, *wherein the first camera is positioned after a ball drop point, the second camera is positioned between a launch point and. the drop point, and the third camera is positioned behind the launch point* (As can be seen Lutz discloses the positioning of cameras behind the launch point, between the launch point and drop point, and after the drop point) (Lutz Fig 5 and 6).

As per claim 7,

a first camera for photographing a flying ball from a back of the flying ball (Lutz disclose multiple cameras that each posses a unique and individual angle of view. Lutz discloses a first camera 114a/214a that is positioned to photograph a rear portion of the ball in flight) (Lutz 10:57 – 11:39)*;*

a second camera having an angle of view related to that of the first camera and serving to: photograph the back of the flying ball later than the first camera (Lutz discloses at least one side camera 112a/212a-d that posses angles of view that are related to the first camera and photograph the back of the flying ball later than the first) (Lutz 10:57 - 11:39);

a third camera for photographing a front of the flying ball (116/216 that photographs a front portion of the ball when in flight) (Lutz 10:57 – 11:39);

a control portion for controlling photographing timings of the first, second and third cameras for obtaining a plurality of synchronized images by the first, second and third cameras; (Lutz discloses a trigger device that controls the timing as per when the cameras operate to take images of the ball in flight) (Lutz 5:17 – 43)*;*

However Lutz does not specifically disclose

"a calculating portion for calculating position coordinates of the ball based on image data obtained by the first, second and third cameras as time series data with the flight of the golf ball, by triangulation, and based on the calculated position coordinates, the ball trajectory"

"wherein the first camera and the second camera are located at substantially the same distance, at the same elevation and directly behind the launch point, said first and second cameras are inclined upward from a horizontal direction, and an angle of inclination of said first, camera is greater than an angle of inclination of said second camera."

However, Segen discloses a method of tracking the trajectory and path of a ball in motion by means of cameras. Segen specifically states that frames may be sampled and three-dimensional ball positions are determined by a digital processor which triangulates the relative positions of the tracked ball's pixel coordinates from concurrent frames from each of the cameras able to track the ball (Segen 6:16 - 45, 46 - 55).

It would be obvious to one of ordinary skill in the art to modify Lutz in view of Segen to provide a means to calculate the balls trajectory based on triangulation of the ball position coordinates in the captured frames as recorded by the cameras. By triangulating the ball positions in three dimensions an accurate representation of the balls trajectory can be obtained and be modeled.

Lutz, however, does disclose that in the embodiment of Figure 1 that the first and second cameras maybe located behind the launch point and at substantially the same elevation and distance. In the embodiment of Figure 7 the cameras may have different

angles of view and may be angles upward more so than other cameras (Lutz 11:40 – 47).

It would be obvious to one of ordinary skill in the art to combine the embodiments of Lutz, specifically the embodiments of figures 1 and 7 to provide an imaging system that incorporates many cameras at varying positions (i.e. behind and in front of the launch points) and having different inclined angles of view along the balls flight path. This would provide a more accurate imaging representation of the trajectory of the ball and also provide for additional data to be collected such as velocity data and spin decay rates (Lutz 11:54 – 56).

As per claim 8, *wherein said first and second cameras are inclined upward from a horizontal direction, and an angle of inclination of said first camera is less than an angle of inclination of said second camera* (Lutz discloses that the cameras each have different incline angles that will affect the angles of view) (Lutz 11:40 – 47).

As per claim 9, *wherein the flying ball is photographed by only said first and said third camera during a first portion of the flight of the flying ball, said first, second and third cameras during a second portion of the flight of the flying ball, and only said second and third cameras during a third portion of the flight of the flying ball* (Lutz discloses that each camera may have different focal lengths wherein they can image the ball in flight. Thus some cameras may be able to photograph the ball and others may not be able to depending on the location of the ball at a given time) (11:7 – 17).

As per claim 10, *wherein the flying ball is photographed by only said third and said second camera during a first portion of the flight of the flying ball, said first, second*

and third cameras during a second portion of the flight of the flying ball, and only said first and third cameras during a third portion of the flight of the flying ball (Lutz discloses that each camera may have different focal lengths wherein they can image the ball in flight. Thus some cameras may be able to photograph the ball and others may not be able to depending on the location of the ball at a given time) (11:7 – 17).

As per claim 11, *wherein a correspondence of the coordinates in the angle of view of the first camera to those in the angle of view of the second camera is grasped by the calculating portion* (Lutz discloses a calculating portion that calculates the position coordinates of the ball in the multiple images that are each taken by the plurality of cameras. Specifically Lutz discloses that position data can be determined to subsequently determine the trajectory of the ball. The ball's trajectory is determined by the x-y coordinate data that is determined by the multiple images that the ball is photographed in.) (Lutz 9:66 - 10:9).

As per claim 12, *wherein the flying ball is photographed by only said first and said third camera during a first portion of the flight of the flying ball, said first, second and third cameras during a second portion of the flight of the flying ball, and only said second and third cameras during a third portion of the flight of the flying ball* (Lutz discloses that each camera may have different focal lengths wherein they can image the ball in flight. Thus some cameras may be able to photograph the ball and others may not be able to depending on the location of the ball at a given time) (11:7 – 17).

As per claim 13, *wherein the angle of inclination of the second camera is between 7 and 40 degrees.* Lutz nor Segen does not disclose that the second camera's

angle of inclination is between 7 and 40 degrees. However both Lutz and Segen discloses systems wherein the angles of view of the camera's may be placed in variable positions to best capture the trajectory of the ball and thus model and simulate The trajectory of the ball (Segen 4:42 – 61). Thus it would be obvious to one or ordinary skill in the art to modify the combination of Lutz and Segen to specify a range of inclination angles for the various cameras to provide complete coverage of the gaming court or environment.

Response to Arguments

Applicant's arguments with respect to claim 1, 2, 4, 5, 7 -12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSS A. WILLIAMS whose telephone number is 571-272-5911. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ronald Laneau can be reached on 571-272-6784. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ronald Laneau/
Primary Examiner, Art Unit 3714

/R. A. W./
Examiner, Art Unit 3714